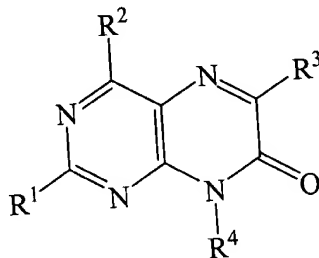


IN THE CLAIMS:

Please cancel claim 45 without prejudice or disclaimer. Please amend claims 18 and 23-24 as follows. All claims pending, including those unchanged by the present amendment, are reproduced below for the convenience of the Examiner. A clean version of the amended claims is attached at the end of the present amendment in the section titled "clean version of amended claims." If there is a conflict between the "marked-up" version of the claims below, and the "clean version of amended claims", the "marked-up" version shall control.

1. (Withdrawn) A compound of the formula:



wherein:

R¹ is a member selected from the group consisting of hydrogen and optionally substituted

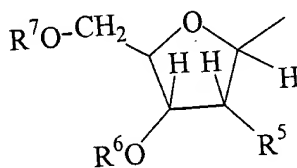
C₁-C₆-alkyl;

R² is a member selected from the group consisting of amino and mono- or di-substituted amino wherein the substituent is a protecting group;

R³ is optionally substituted C₁-C₆ alkyl;

R⁴ is L;

L is of the formula



wherein:

13 R⁵ is hydroxyl;

14 R⁶ is a member selected from the group consisting of hydrogen, phosphoramidite, an H-
15 phosphonate, a methyl phosphonate, a phosphorothioate, a phosphotriester, a
16 hemisuccinate, a hemisuccinate covalently bound to a solid support, a
17 dicyclohexylcarbodiimide, and a dicyclohexylcarbodiimide covalently bound to a
18 solid support, a hydroxyalkyl, and a hydroxyalkyl covalently bound to a solid
19 support; and

20 R⁷ is a member selected from the group consisting of hydrogen, a phosphate, a
21 triphosphate, and a protecting group.

1 2. (Withdrawn) A compound in accordance with claim 1, wherein

2 R¹ is hydrogen;

3 R² is a member selected from the group consisting of amino, mono-, and di-substituted
4 amino wherein the substituents are members selected from the group consisting of
5 benzoyl, isobutyryl, phthaloyl, di-n-butylaminomethylidene,
6 dimethylaminomethylidene, p-nitrophenylethoxycarbonyl and
7 dimethylaminomethylenamino;

8 R⁴ is L;

9 R⁵ is hydroxyl;

10 R⁶ is a member selected from the group consisting of consisting of hydrogen,
11 phosphoramidite, H-phosphonate, hemisuccinate, and hemisuccinate covalently
12 bound to a solid support; and

13 R⁷ is a member selected from the group consisting of hydrogen, trityl,
14 monomethoxytrityl, dimethoxytrityl, phthaloyl, di-n-butylaminomethylene,
15 dimethylaminomethylidene and triphosphate.

1 3. (Withdrawn) A compound in accordance with claim 2, wherein

2 R² is a member selected from the group consisting of amino and an amino group mono-
3 substituted by a protecting group selected from the group consisting of di-n-

butylaminomethylidene, p-nitrophenylethoxycarbonyl, and
dimethylaminomethylenamino;

R⁵ is hydroxyl;

R⁶ is a member selected from the group consisting of hydrogen, β -cyanoethyl-N-diisopropyl phosphoramidite and a hemisuccinate covalently bound to controlled pore glass; and

R⁷ is a member selected from the group consisting of dimethoxytrityl, di-n-butylaminomethylene, and dimethylaminomethylidene.

4. (Withdrawn) A compound in accordance with claim 2, wherein

R² is a member selected from the group consisting of amino and an amino group mono-substituted by a protecting group selected from the group consisting of di-n-butylaminomethylidene, p-nitrophenylethoxycarbonyl, and dimethylaminomethylenamino;

R⁵ is hydroxyl;

R⁶ is a member selected from the group consisting of hydrogen and β -cyanoethyl-N-diisopropyl phosphoramidite; and

R⁷ is a member selected from the group consisting of hydrogen and dimethoxytrityl.

5.-9. (Canceled)

10. (Withdrawn) A compound in accordance with claim 1, wherein;

R¹ is optionally substituted C₁-C₆ alkyl;

R² is a member selected from the group consisting of amino, mono-, and di-substituted amino wherein the substituent is a member selected from the group consisting of benzoyl, isobutyryl, phthaloyl, di-n-butylaminomethylidene, dimethylaminomethylidene, p-nitrophenylethoxycarbonyl and dimethylaminomethylenamino;

R³ is optionally substituted C₁-C₆ alkyl;

R⁴ is L;

10 R⁵ is hydroxyl;

11 R⁶ is a member selected from the group consisting of hydrogen, H-phosphonate,
12 phosphoramidite, hemisuccinate, and hemisuccinate covalently bound to a solid
13 support; and

14 R⁷ is a member selected from the group consisting of hydrogen, trityl,
15 monomethoxytrityl, dimethoxytrityl, phthaloyl, di-n-butylaminomethylene, and
16 dimethylaminomethylidene.

1 11. (Withdrawn) A compound in accordance with claim 10, wherein

2 R¹ is methyl;

3 R² is a member selected from the group consisting of amino and an amino group mono-
4 substituted by a protecting group selected from the group consisting of di-n-
5 butylaminomethylidene, p-nitrophenylethoxycarbonyl, and
6 dimethylaminomethylenamino;

7 R³ is methyl;

8 R⁵ is hydroxyl;

9 R⁶ is a member selected from the group consisting of hydrogen, β -cyanoethyl-N-
10 diisopropyl phosphoramidite and a hemisuccinate covalently bound to controlled
11 pore glass; and

12 R⁷ is a member selected from the group consisting of dimethoxytrityl, di-n-
13 butylaminomethylene, and dimethylaminomethylidene.

1 12. (Withdrawn) A compound in accordance claim 10, wherein

2 R¹ is methyl;

3 R² is a member selected from the group consisting of amino and an amino group mono-
4 substituted by a protecting group selected from the group consisting of di-n-
5 butylaminomethylidene, p-nitrophenylethoxycarbonyl, and
6 dimethylaminomethylenamino;

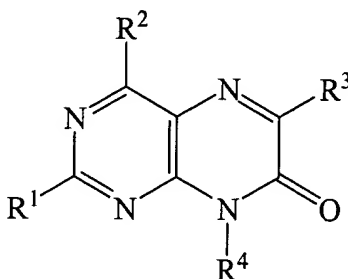
7 R⁵ is hydroxyl;

8 R^6 is a member selected from the group consisting of consisting of hydrogen and β -
9 cyanoethyl-N-diisopropyl phosphoramidite; and

10 R^7 is a member selected from the group consisting of hydrogen and dimethoxytrityl.

1 13.-17. (Canceled)

1 18. (Currently amended) An oligonucleotide comprising one or more
2 nucleotide monomers, said monomers having the formula



3
4 wherein:

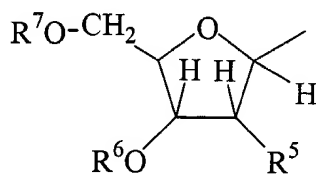
5 R^1 is a member selected from the group consisting of hydrogen and optionally substituted
6 C_1 - C_6 -alkyl;

7 R^2 is a member selected from the group consisting of amino and mono- or di-substituted
8 amino wherein the substituent is a protecting group;

9 R^3 is **optionaloptionally** substituted C_1 - C_6 alkyl;

10 R^4 is L;

11 L is of the formula



12
13 wherein:

14 R^5 is a member selected from the group consisting of hydrogen and hydroxyl;

15 R^6 is a member selected from the group consisting of hydrogen, a phosphate, a phosphate
16 covalently attached to a nucleotide, a phosphate covalently attached to a

17 nucleoside; a hemisuccinate covalently bound to a solid support, a
18 dicyclohexylcarbodiimide covalently bound to a solid support, and a hydroxyalkyl
19 covalently bound to a solid support; and
20 R^7 is a member selected from the group consisting of hydrogen, a phosphate, a phosphate
21 covalently attached to a nucleotide and a phosphate covalently attached to a
22 nucleoside;
23 wherein at least one of R^6 and R^7 is a phosphate covalently attached to adenosine.

1 19. (Previously amended) An oligonucleotide in accordance with claim 18,
2 wherein:

3 R^1 is hydrogen;
4 R^2 is amino;
5 R^3 is methyl;
6 R^5 is hydrogen and hydroxyl;
7 R^6 is hydrogen; and
8 R^7 is a phosphate covalently attached to adenosine.

1 20. (Original) An oligonucleotide in accordance with claim 19, wherein:
2 R^5 is hydrogen.

1 21. (Original) An oligonucleotide in accordance with claim 19 wherein:
2 R^5 is hydroxyl.

1 22. (Previously amended) An oligonucleotide in accordance with claim 18,
2 wherein:

3 R^1 is optionally substituted C_1 - C_6 -alkyl;
4 R^2 is amino;
5 R^3 is methyl;
6 R^5 is hydrogen and hydroxyl;
7 R^6 is hydrogen; and

8 R⁷ is a phosphate covalently attached to adenosine.

1 23. (Currently amended) An oligonucleotide in accordance with claim 22,
2 wherein
3 R¹ is methyl; and
C2 4 R⁵ is hydrogen.

1 24. (Currently amended) An oligonucleotide in accordance with claim 22,
2 wherein
3 R¹ is methyl; and
4 R⁵ is hydroxyl.

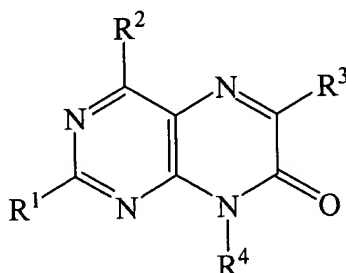
1 25. (Original) An oligonucleotide in accordance with claim 18, wherein said
2 nucleotide monomers are at the 3' end of said oligonucleotide.

1 26. (Original) An oligonucleotide in accordance with claim 18, wherein said
2 nucleotide monomers are at the 5' end of said oligonucleotide.

1 27. (Original) An oligonucleotide in accordance with claim 18, wherein said
2 nucleotide monomers are surrounded by 1 to 10 pyrimidine monomers.

1 28. (Previously amended) An oligonucleotide in accordance with claim 18,
2 wherein said oligonucleotide is a member selected from the group consisting of SEQ ID NO:1,
3 SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ
4 ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ
5 ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19,
6 SEQ ID NO:20, SEQ ID NO:21 and SEQ ID NO:22.

1 29. (Previously amended) A method of detecting the presence, absence, or
2 quantity of a target nucleic acid, said method comprising the steps of:
3 a) contacting said target nucleic acid with a nucleic acid probe wherein said nucleic acid
4 probe comprises compound of the formula:



5 wherein:
6

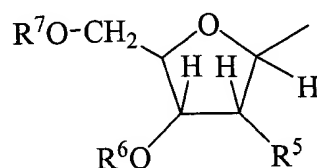
7 R¹ is a member selected from the group consisting of hydrogen and optionally substituted
8 C₁-C₆-alkyl;

9 R² is a member selected from the group consisting of amino and mono- or di-substituted
10 amino wherein the substituent is a protecting group;

11 R³ is optionally substituted C₁-C₆ alkyl;

12 R⁴ is L;

13 L is of the formula



14 wherein:
15

16 R⁵ is a member selected from the group consisting of hydrogen and hydroxyl;

17 R⁶ is a member selected from the group consisting of hydrogen, phosphoramidite, an H-
18 phosphonate, a methyl phosphonate, a phosphorothioate, a phosphotriester, a
19 hemisuccinate, a hemisuccinate covalently bound to a solid support, a
20 dicyclohexylcarbodiimide, and a dicyclohexylcarbodiimide covalently bound to a
21 solid support; and

22 R^7 is a member selected from the group consisting of a phosphate covalently attached to a
23 nucleotide and a phosphate covalently attached to a nucleoside;
24 wherein, at least one of R^6 and R^7 is a phosphate covalently attached to adenosine;
25 located in said probe such that, when said probe hybridizes to said target nucleic acid said
26 compound is in a loop that does not participate in complementary base pairing
27 with a nucleotide of said target nucleic acid; and
28 b) detecting the fluorescence produced by said fluorescent nucleotide when said probe
29 forms a hybrid duplex with said target nucleic acid.

1 30. (Original) A method of claim 29, wherein said loop ranges in length from
2 about 1 to about 100 nucleotides when said probe hybridizes to said target nucleic acid.

1 31. (Original) A method of claim 29, wherein said loop is an insertion in said
2 nucleic acid probe which is otherwise complementary to said target nucleic acid or to a
3 contiguous subsequence of said target nucleic acid.

1 32. (Original) A method of claim 31, wherein said insertion is three
2 nucleotides in length and comprises two nucleotides each adjacent to said compound.

1 33. (Original) A method of claim 32, wherein at least one nucleotide adjacent
2 to said compound is a purine.

1 34. (Original) A method of claim 33, wherein at least one nucleotide adjacent
2 to said compound is an adenosine.

1 35. (Original) A method of claim 32, wherein at least one nucleotide adjacent
2 to said compound is a pyrimidine.

1 36. (Original) A method of claim 35, wherein at least one nucleotide adjacent
2 to said compound is a cytosine.

1 37. (Original) A method of claim 34, wherein said compound is bordered by
2 at least two adjacent purines in both the 5' and 3' direction.

1 38. (Original) A method of claim 37, wherein said adjacent purines are
2 adenosine.

1 39. (Original) A method of claim 31, wherein said insertion is said
2 compound.

1 40. (Original) A method of claim 31, wherein said insertion is self-
2 complementary and forms a hairpin wherein said compound is present in the loop of said hairpin
3 and does not participate in complementary base pairing.

1 41. (Original) A method of claim 29, wherein the nucleotides comprising said
2 loop are selected such that they are not complementary to the corresponding nucleotides of the
3 target nucleic acid when said probe is hybridized to said target nucleic acid and wherein said
4 probe is complementary to at least two non-contiguous subsequences of said target nucleic acid.

1 42. (Original) A method of claim 29, wherein said fluorescent nucleotide is
2 present in a terminal subsequence of said nucleic acid probe wherein said terminal subsequence
3 does not hybridize to said target nucleic acid when the remainder of said nucleic acid probe
4 hybridizes to said target nucleic acid.

1 43. (Original) A method of claim 42, wherein said terminal subsequence
2 forms a terminal hairpin by hybridization with a second subsequence of said probe such that said
3 fluorescent nucleotide is present in a loop of said hairpin and does not participate in
4 complementary base pairing.

1 44. (Original) A method of claim 29, wherein said detecting comprises
2 detecting an increase in fluorescence of said fluorescent nucleotide when said probe forms a
3 hybrid duplex with said target nucleic acid.

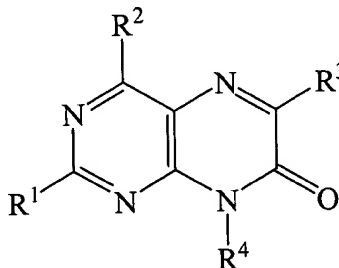
✓
1 45. ~~(Canceled)~~ A kit for the detection of nucleic acid-nucleic acid
2 interactions comprising a container, said container containing a compound in accordance with
3 claim 1, and instructions for use.

1 46. (Previously added) An oligonucleotide in accordance with claim 18
2 wherein R⁶ and R⁷ are both adenosine.

1 47. (Previously added) An oligonucleotide in accordance with claim 46
2 wherein an adenosine is next to R⁶ and an adenosine is next to R⁷.

Please re-present claim 45 to read as follows.

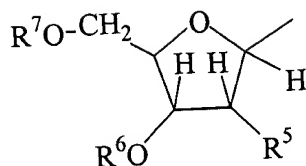
1 48. (Re-presented - formerly dependent claim 45) A kit for the detection of
2 nucleic acid-nucleic acid interactions comprising instructions for use, and a container, said
3 container containing a compound of the formula:



4
5 wherein:
6 R¹ is a member selected from the group consisting of hydrogen and optionally substituted
7 C₁-C₆-alkyl;
8 R² is a member selected from the group consisting of amino and mono- or di-substituted
9 amino wherein the substituent is a protecting group;
10 R³ is optionally substituted C₁-C₆ alkyl;
11 R⁴ is L;

12

L is of the formula



13

14

wherein:

15

R⁵ is hydroxyl;

16

R⁶ is a member selected from the group consisting of hydrogen, phosphoramidite, an H-

17

phosphonate, a methyl phosphonate, a phosphorothioate, a phosphotriester, a

18

hemisuccinate, a hemisuccinate covalently bound to a solid support, a

19

dicyclohexylcarbodiimide, and a dicyclohexylcarbodiimide covalently bound to a

20

solid support, a hydroxyalkyl, and a hydroxyalkyl covalently bound to a solid

21

support; and

22

R⁷ is a member selected from the group consisting of hydrogen, a phosphate, a

23

triphosphate, and a protecting group.
